

CLAIMS

The listing of claims below replaces all prior listings and versions.

1. (Currently Amended) A method for fast converging an end-to-end service, comprising:

 setting routing information of at least two tunnels in a double-ascription Provider Edge (PE) of a remote Customer Edge (CE), wherein, an initial node of the tunnels is the double-ascription PE of the remote CE, and a terminal node of the tunnels is the PE which is connected with the remote CE;

 detecting tunnel states to obtain state information of the at least two tunnels;

 the double-ascription PE of the remote CE obtaining available routing information from the routing information of the at least two tunnels according to the tunnel state information and the routing information of the at least two tunnels[[],]; and

 forwarding [[the]] service according to the routing information of the tunnel corresponding to the available routing information.

2. (Original) The method according to claim 1, wherein, the tunnels comprise an inner layer tunnel and an outer layer tunnel; the inner layer tunnel is a Virtual Private Network (VPN) tunnel, while the outer layer tunnel is a Label Switching Path (LSP) tunnel or a Genetic Routing Encapsulation (GRE) tunnel or an Internet Protocol Security (IPSec) tunnel.

3. (Original) The method according to claim 2, wherein, the step of the setting routing information of at least two tunnels in a double-ascription PE of a remote CE comprises:

 the double-ascription PE of the remote CE setting optimal routing information and

suboptimal routing information of the tunnels in a route forwarding table according to pre-configured matching strategies.

4. (Original) The method according to claim 3, wherein, the procedure of setting a suboptimal routing information in the route forwarding table is:

setting the suboptimal routing information in the forwarding items of the optimal routing information in the route forwarding table.

5. (Original) The method according to claim 2, wherein, the step of detecting tunnel states to obtain the state information of the tunnel comprises:

when a control layer of the double-ascription PE of the remote CE determines that some changes take place in the state of the outer layer tunnel according to Bidirectional Forwarding Detection (BFD) or tunnel fast convergence techniques, it advertising the available/unavailable state information of the tunnel to the forwarding engine.

6. (Original) The method according to claim 5, wherein, there is a tunnel state field in the forwarding table of the forwarding engine; and

the step of advertising the available/unavailable state information of the outer layer tunnel to the forwarding engine comprises:

the double-ascription PE of the remote CE advertising the available/unavailable state information of the outer layer tunnel to the route forwarding table of the forwarding engine, and updating the content of state field of the corresponding item.

7. (Original) The method according to claim 5, wherein, the step of advertising the available/unavailable state information of the outer layer tunnel to the forwarding engine comprises:

the double-ascription PE of the remote CE advertising the available/unavailable state information of the outer layer tunnel to an independent storage unit of the forwarding engine, and updating the state information wherein.

8. (Previously Presented) The method according to claim 5, wherein, the tunnels comprise: a primary tunnel and a backup tunnel which are mutual backup tunnels; and

the step of the double-ascription PE of the remote CE obtaining the available routing information comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the primary tunnel, it obtaining and judging the state information of the primary tunnel;

if the primary tunnel is available, the double-ascription PE of the remote CE forwarding the service to the remote CE through the primary tunnel;

if the primary tunnel is unavailable, forwarding the service to the remote CE through the backup tunnel.

9. (Previously Presented) The method according to claim 5, further comprising: before forwarding the service to the remote CE through the backup tunnel, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available.

10. (Previously Presented) The method according to claim 5, wherein, the at least two tunnels comprises: tunnels which are mutual load sharers; and

the step of the double-ascription PE of the remote CE obtaining available routing information and forwarding the service comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the mutual load sharing tunnels, if it is determined that one of the tunnels is unavailable while others are available according to the state information of the mutual load sharing tunnels, it forwards the service to the remote CE through the available tunnel.

11. (Currently Amended) A Provider Edge (PE) equipment for fast converging an end-to-end service, comprising: a storage module, a tunnel state detecting module and a forwarding module; wherein,

the storage module is configured to store routing information and tunnel state information of at least two tunnels, whose originate node is a double-ascription PE of a remote Customer Edge (CE), and whose terminal node is a PE connected with the remote CE respectively, and configured to store tunnel state information of the at least two tunnels; and

the tunnel state detecting module is configured to detect tunnel states and update the tunnel state information stored in the storing module when the tunnel state is changed; and

the forwarding module is configured to obtain available routing information from the routing information of the at least two tunnels according to the routing information and the tunnel state information of the at least two tunnels stored in the storing module, and configured to forward

service according to the routing information of the tunnel corresponding to the available routing information.

12. (Previously Presented) The method according to claim 6, wherein, the tunnels comprise:
a primary tunnel and a backup tunnel which are mutual backup tunnels; and

the step of the double-ascription PE of the remote CE obtaining the available routing information comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the primary tunnel, it obtaining and judging the state information of the primary tunnel;

if the primary tunnel is available, the double-ascription PE of the remote CE forwarding the service to the remote CE through the primary tunnel;

if the primary tunnel is unavailable, forwarding the service to the remote CE through the backup tunnel.

13. (Previously Presented) The method according to claim 7, wherein, the tunnels comprise:
a primary tunnel and a backup tunnel which are mutual backup tunnels; and

the step of the double-ascription PE of the remote CE obtaining the available routing information comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the primary tunnel, it obtaining and judging the state information of the primary tunnel;

if the primary tunnel is available, the double-ascription PE of the remote CE forwarding the service to the remote CE through the primary tunnel;

if the primary tunnel is unavailable, forwarding the service to the remote CE through the backup tunnel.

14. (Previously Presented) The method according to claim 6, further comprising: before forwarding the service to the remote CE through the backup tunnel, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available.

15. (Previously Presented) The method according to claim 7, further comprising: before forwarding the service to the remote CE through the backup tunnel, obtaining the state information of the backup tunnel and confirming that the state information of the backup tunnel is available.

16. (Previously Presented) The method according to claim 6, wherein, the at least two tunnels comprises: tunnels which are mutual load sharers; and

the step of the double-ascription PE of the remote CE obtaining available routing information and forwarding the service comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the mutual load sharing tunnels, if it is determined that one of the tunnels is unavailable while others are available according to the state information of the mutual load sharing tunnels, it forwards the service to the remote CE through the available tunnel.

17. (Previously Presented) The method according to claim 7, wherein, the at least two tunnels comprises: tunnels which are mutual load sharers; and

the step of the double-ascription PE of the remote CE obtaining available routing information and forwarding the service comprises:

when the double-ascription PE of the remote CE needs to forward the service to the remote CE through the mutual load sharing tunnels, if it is determined that one of the tunnels is unavailable while others are available according to the state information of the mutual load sharing tunnels, it forwards the service to the remote CE through the available tunnel.